JUL 12 1989

EXPRESS MAIL LB-152841458
RETURN RECEIPT REQUESTED

Donald Murphy
Facility Coordinator
Langan Environmental Services
River Center Drive 2
Elmwood Park, NJ 07407

Re: SCP-Carlstadt Site, EPA Comments on Draft Feasibility Study submitted pursuant to Administrative Order, Index No. II-CERCLA-50114

Dear Mr. Murphy:

EPA has reviewed the Draft Feasibility Study (FS) for the SCP-Carlstadt site. Many of the major deficiencies in the FS were discussed at our meeting on June 12, 1989, and in a subsequent telephone conversations on June 20 and 22, 1989. You indicated that ERM has been working on correcting these major deficiencies during the past month.

The attached revisions must be made to the Draft FS, in accordance with Paragraph 27.C. of the above-referenced Order. The Revised Draft FS must be submitted to EPA by no later than two weeks from your receipt of this letter.

If you have any questions regarding the attached comments or would like to arrange a meeting to discuss them in further detail, please contact Janet Feldstein, of my staff.

Sincerely yours,

Raymond Basso, Chief
New Jersey Compliance Branch

Attachment

cc: Pamela Lange, NJDEP
Harry Yeh, EBASCO

SYMBOL					
SURNAME					
DATE --					

SCP Carlstadt Draft Feasibility Study
USEPA Comments/Required Revisions

General Comments

Recommended Alternative "C":

The recommended Alternative C does not adequately comply with the explicit requirements and intent of the Superfund Amendments and Reauthorization Act of 1986 ("SARA"), and with the cleanup standards for soil and groundwater at the site identified by EPA Region II.

Specifically, this alternative does not provide for the following: utilization of a permanent solution to the maximum extent practicable, utilization of treatment technologies to the maximum extent practicable, and compliance with the Polychlorinated Biphenyl ("PCB") cleanup requirement provided by EPA. Furthermore, Alternative C is highly dependent on continuous and long-term monitoring, and its acceptability is premised upon the waiver of ARARs/TBCs for soil and groundwater at the site, for which no justification has been provided or no specific requests have been made.

This alternative allows high levels of contaminants to remain, untreated, at the site. Reduction of contaminant toxicity or volume is limited to volatile organics. PCBs would remain across the site soils at levels in the hundreds of parts per million (ppm) range and in some areas, at levels in the thousands of ppm. In addition, inorganic contaminants would remain untreated at unacceptable levels across the site.

The Draft FS Report asserts that the recommended Alternative C will effectively contain these remaining contaminants, and therefore, eliminate exposure pathways. However, the Draft FS Report does not substantiate this assumption. There is no evidence to support the contention that contaminants would not continue to migrate to the underlying clay layer and deeper aquifers. For example, the calculations and assumptions used to determine the 1 gpd outflow from the area of contamination into the underlying till aquifer have not been provided. It is unclear whether these calculations accounted for all possible means of infiltration and contaminant migration. In addition, further consolidation of the fill layer may cause cracking in the cap and/or slurry wall, allowing both vertical and lateral infiltration into the area of remaining contamination. Furthermore, excess water may accumulate under the cap which would require periodic removal and treatment.

The performance of Alternative C with respect to VOC removal is not defined in the FS. The expected VOC removal efficiency via vacuum extraction is not provided and the alternative description does not address the VOCs remaining in the soil, both in terms of quantity and fate.

More detail should be provided regarding the vacuum extraction system (number of wells, air flow rates, projected VOC removal rates and off-gas treatment). The basis for the 6-month treatment time should be provided. The justification provided for performance of the slurry wall and the vacuum extraction system is inadequate.

Without addressing these points, it is unclear how it can be stated that this alternative will reduce any contaminant volume.

There is no basis to assume that tank stabilization will be an effective remediation measure. Consideration should be given to the possibility of tank failure and the fate of the tank's highly contaminated contents (i.e., PCBs in excess of 3 percent).

Future land use restrictions must be identified for Alternative C.

Contrary to the last statement in Section 5, the other site Alternatives (i.e., D, E, F, G, and H) entail additional treatment options which substantially increase the level of protection of human health and the environment as compared to Alternative C. The additional treatment provided by other alternatives would substantially reduce the soil contaminant volume and mobility. Other alternatives include treatment of the PCB contamination and metals contamination, which are not addressed by Alternative C, and potentially, treatment of more of the VOC contamination. All other alternatives (except A) afford a higher degree of performance than Alternative C.

Consideration of Partial Soil/Sludge Treatment Alternatives:

Additional consideration should be given to partial site treatment alternatives, similar to the approach taken with respect to PCB treatment in Alternatives E and F. In particular, separate treatment of the sludge pit area must be considered. Partial site remediation using in-situ vitrification, including possibly PCB hot spots, should be considered. Partial site treatment alternatives should then be combined to develop an overall remedial action alternative for the site. Some of the uncertainties raised regarding treatability study results can be addressed by the combinations of technologies into one alternative. For example, a combination of acid extraction for metals, with incineration for organics removal would be a more viable alternative for complete remediation than PCB extraction, for which the treatability study results were less conclusive.

Compliance With ARARs/TBCs:

Land Disposal Restrictions:

The FS does not properly address the Land Disposal Restrictions (LDRs). The LDRs are applicable requirements for many of the alternatives evaluated in the FS. Respondents have repeatedly been informed, since as early as July 27, 1988, that the LDRs would be applicable requirements.

The prerequisites for the LDRs to be applicable to a Superfund response action are as follows:

1. the action must constitute "placement";
2. the waste must be a RCRA hazardous waste; and
3. the RCRA waste must be restricted under the LDRs at the time of placement.

Placement does not occur when waste is moved within an area of contamination ("AOC"); however, removal of waste from an AOC, treating it, and then returning the treated waste to the AOC does constitute placement. Certain alternatives evaluated in the FS do not involve placement (i.e. containment, in-situ treatment alternatives). However, for all the alternatives involving excavation and on-site or off-site treatment or disposal of the wastes, the first prerequisite is satisfied.

EPA has determined that the soils and sludges at the site are RCRA hazardous wastes. The wastes are considered "characteristic" hazardous wastes. In addition, the wastes contain "California List" wastes. Therefore, the second prerequisite is satisfied.

The LDRS are being phased in over time; however, all RCRA characteristic hazardous wastes will be restricted by May, 1990. Soil and debris has been granted a capacity extension until November, 1990.

Until November, 1990, soil and debris does not have to meet the promulgated treatment standards, but if land disposal occurs, the receiving unit (e.g., the site) must meet the RCRA minimum technology requirements (double liner, leachate collection system, ground water monitoring).

Since it will take some time for the design of any remedy selected, it must be assumed that the remediation may not be completed before November, 1990. The LDRs are therefore applicable requirements for all alternatives involving placement, and compliance with these regulations must be discussed for each effected alternative.

TSCA Disposal Requirements:

Soil/sludge that is contaminated with PCBs at levels greater than 50 ppm which is moved from one area of the site to another (consolidation) must be incinerated, treated by a method equivalent to incineration, or disposed of in a chemical waste landfill. Treatment methods equivalent to incineration require that the treated residual contains PCBs at levels less than 2 ppm PCBs.

Therefore, for all alternatives which involve movement of the soils/sludges, or excavation and treatment (but do not involve incineration) the soils must be either treated to 2 ppm, or disposed of (on-site or off-site) in a unit which meets the requirements of a TSCA chemical waste landfill.

Additional ARARs:

Compliance with the following additional action-specific ARARs must be discussed under Section 4 in the discussion of ARARs, for each alternative to which it is applicable:

-40 CFR 264 (RCRA), requires control of wind dispersal (particulates) (all alternatives)

-NJAC 7:26 (RCRA) (same as above)

-40 CFR 264, Subpart X, applicable to steam stripping and vapor extraction (all alternatives involving these technologies)

-40 CFR 264, Subpart F, groundwater monitoring requirements, (all alternatives)

40 CFR 50:NAAQS Air standards for particulate matter (all alternatives)

NJAC 7:27-13:AAS Air standards for suspended particulate matter, hydrocarbons, and photochemical oxidants (all alternatives)

For all Alternatives, the FS must discuss how the alternative will comply with these action specific ARARs, as well as the requirements provided in Appendix G.

NJ Proposed MCLs:

In appendix G, Table 4.2 lists New Jersey proposed MCLs. These MCLS were promulgated on January 3, 1989, and therefore are no longer "to-be considered", but are ARARs for the groundwater at the site.

New Jersey Soil Cleanup Objectives:

The New Jersey Soil Cleanup Objectives for PCBs must be considered in evaluation of performance of the remedial alternatives. The alternatives involving partial site treatment (i.e. contaminant extraction for PCBs) only discuss treatment of PCBs to a level of 25 ppm. The New Jersey requirement, referenced in Appendix G to the FS, allows PCBs to remain in soil at a maximum level of 5 ppm PCBs. Consequently, the ability of various alternatives to attain this requirement must be discussed.

Costs:

The cost estimates provided, both for Phase II and Phase III, contain unrealistic calculation for indirect costs (35%) and contingencies (50% or 30%). The values which should be substituted are as follows:

Indirect costs: a maximum of 25%
Contingency: a maximum of 20%

The costs must all be recalculated to include these values, or lower values if better, alternative-specific estimates can be made. In addition, the FS must contain detailed breakdowns of all cost calculations provided in the report.

References to the Remedial Investigation Report:

Throughout the FS, there are several references to the Dames & Moore Remedial Investigation Report. It must be made clear that this report is still in "Draft" form, and has not yet been approved by US EPA.

References to the TERRA Public Health Assessment:

All references to this document must be deleted from the FS; it has not been approved by US EPA. Revise Section 1.7 accordingly. EPA provided the summary Table from its Endangerment Assessment (Table "E-2"), which should be included in the FS. EPA's Endangerment Assessment will discuss the risks associated with the site, and will be published along with the FS for public review and comment.

Additional Appendix: EP Toxicity Data

The results of the EP Toxicity analyses for soils at the site, submitted to EPA on May 12, 1989, should be included as an appendix to the FS, and must be discussed in the text.

Executive Summary

On page ES-3, in the third paragraph, add the following sentence: "This tank contains highly contaminated sludge."

The thickness of the FOU is stated on page ES-3 in paragraph 1 to be, on average, 8.4 feet, but in paragraph four, 12 feet. Correct this inconsistency.

Revise the following remedial action objectives throughout the FS:

The first remedial action objective should be revised to read: "Mitigate conditions in the First Operable Unit which could result in an unacceptable risk to human health or the environment from the water table aquifer or migration of contaminants to other water bearing units hydraulically connected to the water table aquifer."

The third remedial action objective should be revised to read : "Mitigate conditions in the First Operable Unit which may result in an unacceptable risk to human health or the environment from continued migration of contaminants to Peach Island Creek. "

On page ES-3, add the following two remedial action objectives (also add throughout the FS where remedial action objectives are discussed):

-Attain ARARs/TBCs, provided by EPA, for shallow groundwater in the First Operable Unit.

-Attain ARARs/TBCs, provided by EPA, for soils/sludges in the First Operable Unit.

EPA previously instructed Respondents that ARARs/TBCs constitute remedial action objectives (see letter to H. Gilbert Weil, dated February 23, 1989, at page 2). Respondents apparently failed to incorporate this instruction.

On page ES-8, delete the "Recommended Site Alternative" section.

Section 1

On page 1-4, the nine criteria should be listed in the order in which they are appropriately addressed later in the FS (see comment in Section 4.0).

On page 1-8, the heading for Section 1.6.3 "Fill" is inappropriate, since the section contains a description of the various components of the FOU. Revise accordingly.

On page 1-9, under the description of the sludge pit, the approximate depth of the sludge encountered in ERM's excavation should be provided.

On Page 1-11, under the description of the Water Table Aquifer, add the following sentence to the end of the first paragraph: "However, the silt/clay units have not prevented migration of contaminants from the water table aquifer to the underlying till aquifer."

On page 1-13, in the fourth full paragraph, the "exceptions" to the concentrations less than 0.5 ppm must be discussed. Also, under Section 1.6.5.3, the discussion of metals concentrations should be moved to Section 1.6.5.2 (Till aquifer). Add the following sentence to Section 1.6.5.3: "Preliminary data indicate that the till aquifer is hydraulically connected to the bedrock aquifer."

On page 1-14, delete the reference to the TERRA report; the surface water classification is correct.

Also on this page, under "Data Gaps" clarify that the "ERM sampling efforts" were related to collection of soil /sludge samples for treatability studies. Information regarding the presence of utility lines is critical information for evaluating the implementability of certain alternatives and must be obtained. Locations of sewer lines must be identified in order to effectively evaluate disposal options for treated effluent.

Revise Section 1.7 in accordance with the general comment, above. (Delete references to TERRA Public Health Assessment.)

Tables in Section 1: In the Title of the Tables, include "ppm" in the description of the units.

Section 2.0:

On page 2-3, the calculations performed in Section 2.2.1 appear to have used a porosity of 0.25, and not 0.30, as stated. Check the calculations and revise the stated value(s), as appropriate.

Also on this page, the range of percent of rubble is significant. The FS should simply state the possible range, and delete all references to the "subjective visual observations" by ERM. Delete the third and fourth sentences in the last paragraph on this page.

On page 2-4, provide the details regarding all the calculations for volume of groundwater in the FOU. Under Section 2.2.3, add the following sentence to the last paragraph: "Ground water from the water table aquifer also flows vertically downward into the underlying till aquifer." This conclusion has been drawn by Dames & Moore.

On page 2-5, reference is made to the data on Table 2-1 (conventional parameter analyses); please provide reference to analytical report containing these analyses. Also, in the third bullet, revise second sentence to read "...nor is their lateral extent."

On pages 2-5 through 2-6 (and throughout the report) include additional remedial action objectives: attainment of ARARs/TBCs provided by EPA, both in groundwater and in soil/sludges.

The first remedial action objective should be revised to read: "Mitigate conditions in the First Operable Unit which could result in an unacceptable risk to human health or the environment from the water table aquifer or migration of contaminants to other water bearing units hydraulically connected to the water table aquifer."

On page 2-6, the third remedial action objective should be revised to read: "Mitigate conditions in the First Operable Unit which may result in an unacceptable risk to human health or the environment from continued migration of contaminants to Peach Island Creek. "

The statement on page 2-16 (Section 2.5.6.2) that "data is inconclusive about the existence of hot spots" is unsubstantiated and should be deleted. There are areas of the site which exhibit significantly higher levels of contamination than others; ERM's own treatability study sampling program identified hot spots. Similarly, in Table 2-5, ERM refers to partial treatment of "hot spots". References to these areas throughout the report should be consistent. As noted above, it is logical to examine additional partial site treatment alternatives of "hot spots".

Also, the discussion of the tank sludge here is unclear as to whether the sludge itself should not be considered for partial removal, or that part of the sludge should not be considered for partial removal. The discussion should indicate that it would not be feasible to treat part of the sludge separately, but that

all the sludge will be considered for separate treatment/removal due to its severe contamination.

On pages 2-36, 2-37, and 2-38, in four places under "Initial Screening" of thermal destruction technologies, delete phrase that reads "however, the availability and capacity of these units will have to be evaluated. In addition,." Begin next sentence with "Applicability...".

On page 2-41, the discussions in Section 2.5.10 regarding disposal of soil/sludge should reference the Land Disposal Restrictions, in accordance with general comment, above.

The cross-section displayed on Figure 2-1 should be referenced to a map of the site; points A and A' should be shown on a site map.

In Table 2-4, under soil/sludge treatment, physical/chemical methods, explain what is meant by "Difficulties in implementation due to work environment" under mechanically enhanced volatilization. Provide written justification for the statements under "Thermal Destruction" that there are "no TSCA-approved facilities available" and explain how that impacts incineration of soils/sludges. Also, the costs of O & M should not be listed as "high" for the thermal destruction technologies; these costs should be "low" as with vitrification.

In Table 2-5, institutional actions should be a component of all the ground water alternatives.

Section 3.0:

Section 3.1:

As noted above in comment on page 2-4, provide details regarding ERM's calculations of groundwater volumes/infiltration rates.

On page 3-2, revise the discussion of the Land Disposal Restrictions, in accordance with the general comment, above.

Groundwater Treatability Testing:

The results for UV/Peroxidation showed this technology to be unexpectedly ineffective. The details regarding the amounts of H_2O_2 and UV are only provided for one trial, and should be provided for all other trials. Explain why the sample was not fully oxidized to determine the technology's feasibility. Provide the basis for PSI's determination of cost-effectiveness, and how they determined that a full scale system would reduce organics to less that 1 ppm each, given the poor test results. More details and backup information must be provided to support

the conclusion of full-scale effectiveness. Portions of PSI's report have been omitted (Appendix C-2); these missing portions may provide the test conditions. It is unclear why this technology was retained as a polishing step when removal efficiencies for many organics were so poor. (After steam stripping, the remaining organics such as phenol, methylphenol and phthalates were not removed by UV/Peroxidation to more than 50% efficiency.) Also, if this technology is retained as a potential polishing step, the effects of residual peroxide on the potential discharge options (Creek vs. POTW) must be addressed in the FS.

Critical Fluid extraction appeared to be the most effective treatment system to remove contaminants to well below the discharge criteria provided in Table 3-8. Also, Critical Fluid extraction would likely be effective in treating the more highly concentrated waste streams from the soil treatment alternatives, such as spent extraction/in-situ flushing fluids.

Chemical precipitation tests, which only tested the effectiveness of coagulants, do not appear to achieve the discharge criteria (Table 3-8), yet this is not discussed anywhere in the report. Since ARARS must be achieved, a description of how the ARARs will be achieved must be provided. Hydroxide or sulfide precipitation should be considered and developed in more detail.

Soil/Sludge Treatability Testing:

Incineration Testing and Screening of Alternative S/S 4 (Section 3.4.4):

The only concern raised by the incineration treatability testing is that potential for volatile metal releases will require high efficiency particulate control. Yet, the FS report treats the incineration alternative as if it were highly infeasible.

Although metals emissions are of concern and must be addressed through appropriate controls, the Cr criteria for elimination of this alternative is unacceptable, given the questionable nature of the test results. The high percentage of Chromium (Cr) found in the particulate during testing was an anomaly, due to the relatively high vaporization temperature of Cr. A complete discussion of this anomaly and other test results is missing from the test report (Appendix F). Such a discussion should be provided. It must be noted that in some cases, more Cr is present in the fly ash than the raw sample (HS-1800-30-1 and 2). If a Cr balance is done using the ash and particulate values and assuming the sum is the raw feed amount, then not all the tests indicate such high Cr removals. The lower temperature 1500 F burns indicate much lower removals. In test STP-1500-30-2, only 6% of the Cr is removed; in HS-1500-60-1, only 36%.

Consideration must be given to minimizing the metal emissions by either operating the primary chamber slightly above the determined 1500 F minimum, or pretreating to remove metals using acid extraction. At slightly above 1500 F, PCB removal will still occur, and the afterburner can be designed to achieve complete combustion. It must be recognized and stated in the discussion of the results that the test unit is probably not as efficient as a well-designed commercial unit.

The removal efficiencies of air quality control equipment provided on page 3-44 appear to be low for some metals. Table 3 in Appendix F (p. E-8) indicates over 97% for As, Cd, and Pb for a 60-in venturi assuming gas quenching. It should be emphasized that the efficiencies on page 3-44 are conservative.

The concerns about rubble content and volatile and fugitive dust emissions also apply to all other ex-situ alternatives, and they can not be used to eliminate incineration. Space constraints may also apply to other alternatives, and should not be used to screen out incineration.

Incineration testing was demonstrated to be quite effective for removing and destroying PCBs. Residual concentration was less than 0.12 ppm for the sludge composite with a raw concentration of 15,000 ppm. Incineration tests were generally better than the contaminant extraction results, yet incineration was not considered for partial site treatment for PCB removal. Ash leaching tests also had favorable results, indicating ash may not require stabilization.

Incineration must be carried through for detailed evaluation; both soil incineration and incineration of all site sludges (tank and pit) should be evaluated. Assumptions will have to be made regarding the availability of appropriate controls; if further testing reveals any potential difficulties in accomplishing incineration, pretreatent for metals removal will have to be considered. Results indicate that incineration coupled with pretreatment for metals removal would be a viable alternative for, at a minimum, partial site remediation.

Contaminant Extraction Treatability Testing:

The summary of contaminant extraction treatability test results in Section 3.1.2.2.2 is somewhat misleading with respect to percent removals, and contaminants remaining in the soils. Tests performed on the sludge sample, though achieving 90% removal, show extremely high PCB and VOC concentrations (in the 1000s of ppm) remaining in the sludge.

An explanation should be provided for anomalies in the tests. For example, Table 5 in Appendix D shows high concentrations of PCB -1242 in the residual, but no PCB-1242 was reported in the raw sample, nor in the extraction fluids. (See Table 20)

As noted above, the acid extraction test for metal removal demonstrated that this may be a viable technology for use as pretreatment for incineration. The summary of results should note that removal rates for Cr and other metals were improved by the final water wash; in the sequential trials, the majority of the metals were removed in the water wash, prior to application of the acid, implying that the metals may be quite mobile at the site.

The Appendix D report is missing a discussion of the sequential trial results. The report does not include the Tables and Figures labelled II-, which are referenced in the text.

Solidification/Stabilization Treatability Tests:

The Hazcon test results are not useable with regard to leachability. Contrary to the Scope of Treatability Studies Plan, which was submitted to EPA prior to the conduct of the treatability studies, the majority of organics and inorganics were not analyzed for ("NAF") in the Leachate Testing. The Enreco test results are inconclusive where the EP Tox leaching of the raw sample is compared with TCLP testing of the stabilized sample.

Section 3.2

The first remedial action objective should be revised to read: "Mitigate conditions in the First Operable Unit which could result in an unacceptable risk to human health or the environment from the water table aquifer or migration of contaminants to other water bearing units hydraulically connected to the water table aquifer."

The third remedial action objective should be revised to read : "Mitigate conditions in the First Operable Unit which may result in an unacceptable risk to human health or the environment from continued migration of contaminants to Peach Island Creek. "

On pages 3-12 through 3-13, the discussion of "alternate cleanup levels" should be deleted. Appendix J was not provided with the FS for EPA review. All references to this Appendix anywhere in the FS must be deleted.

Section 3.2.1:

The discussion of "New Jersey Ground Water Quality Standards" should be deleted, and replaced with the following:

> New Jersey's ground water quality standards establish cleanup criteria for ground water classification GW1 through GW4. NJDEP has determined that the water table aquifer is GW 2, due in part to the water table aquifer's hydraulic connection to the underlying till aquifer and potable Bedrock aquifer. Therefore, GW2 standards apply to the water table aquifer.

NJDEP will be providing site specific limits for discharge to Peach Island Creek, which must be met in the event that this discharge option is selected.

On page 3-15, in the second full paragraph, in the sentence "Given the reasoning behind the New Jersey soil cleanup objectives, remedial alternatives which either contain or remove the contaminated soils would be considered to attain these TBCs", change the word "contain" to "immobilize" , and the word "would" to "might".

Section 3.2.2.1:

Groundwater treatment cost estimates were based on a two-year operating period. While the FS does state that the most cost-effective strategy for ground water remediation would assume the use of rental equipment, permanent equipment installations were used to calculate cost. This should be modified in light of the following discussion:

> 1) While the dewatering and treatment may only require a relatively short period of time to remove the groundwater, some form of long term groundwater treatment will be required to collect and treat residual groundwater/ leachate, as part of operation and maintenance. This long-term option would not necessarily be the same alternative chosen for the preliminary dewatering operation. It would probably be more cost effective to dewater and treat using one alternative, and then shift to a less costly, low flow treatment option.
>
> Costs of equipment rental for the short term (two year) treatment should be evaluated and compared with equipment purchase costs.
>
> 2) By evaluating only the purchase price of treatment equipment, and not rental costs, certain high capital cost technologies are less favorable, such as Critical Fluid

Extraction. Critical Fluid Extraction treatability studies demonstrated that this technology provided the most effective remediation of site ground water. The FS should specifically address Critical Fluid Extraction rental for the short term groundwater treatment, with a shift to a different, less costly long term option, such as collection and off-site treatment, as a potential alternative.

Section 3.3

Section 3.3.3.1

On page 3-19, delete the following two sentences from the first full paragraph "According to the data presented in Table 3-6, the total dissolved solids (TDS) level in the shallow groundwater aquifer exceeds the New Jersey GW2 TDS standard (i.e., 500 mg/l). The water table aquifer is not presently used as a potable water supply (i.e. no wells have been finished in this water-bearing zone); therefore, no present, unacceptable risk is apparent."

Also delete the Table (3-6) from the FS report.

In the second full paragraph, in the second to last sentence, delete "or GW3". Also delete the last sentence, and replace with the following :

"No action will not prevent migration of contaminants present in the water table aquifer, will not protect hydraulically connected media, and will not prevent water table aquifer discharge to Peach Island Creek, all of which pose a risk to human health and the environment."

Section 3.3.2.1

On Page 3-20, delete the following paragraph:

"The Limited Action alternative does not provide the remediation necessary for any potential GW2 and GW3 uses. In addition, this action does not provide protection against future ARARs excursions in hydraulically connected media."

Replace with:

"Limited action will not prevent migration of contaminants present in the water table aquifer, will not protect hydraulically connected media, and will not prevent water table aquifer discharge to Peach Island Creek, all of which pose a risk to human health and the environment."

Section 3.3.3

On page 3-21, in the first paragraph, biological treatment is a secondary treatment step, not a primary step.

On page 3-22, in the first full paragraph, delete the first sentence which reads "Similar to GW-1, no apparent, unacceptable risk is associated with the water table aquifer since it is not presently utilized as a potable water supply."

Sections 3.3.5 through 3.3.8

On pages 3-25, 3-27, 3-29, and 3-31, under "effectiveness", each alternative is stated to achieve "essentially the same level of protectiveness as GW-3". The GW-3 alternative includes chemical oxidation and biological treatment, possibly followed by carbon adsorption. Since no treatability studies were performed for biological treatment, and because of the severe contamination in the water table aquifer, it is unlikely that the other alternatives are equally effective. In fact, it is clear that alternatives effectiveness varies significantly; i.e., reductions in toxicity and volume are quite different with different treatment processes. Specific evaluations of the effectiveness of each alternative must be performed, based on the results of the treatability studies and literature reviews. Differences in effectiveness must be pointed out in the report. Effectiveness should be presented in the form of percent removals.

Without an evaluation of relative percent removals of contaminants, the comparison of alternatives performed in Section 3.6 is without merit.

On Pages 3-25, 3-27, 3-29, and 3-31, also under "effectiveness", delete the sentence which reads "No current, unacceptable risk is associated with the ground water in the water table aquifer, since it is not presently used as a potable water supply" (or delete the slight variations of this sentence which appear on certain of those five pages).

Critical Fluid extraction, Alternative GW-7, produced substantially better results during treatability testing. It is unclear why UV/Peroxidation is added to this alternative as a polishing step, since the removal efficiencies for UV/peroxidation were quite low. This comment also applies to GW-6 and GW -8. Explain the benefit derived from the addition of UV/Peroxidation to these three alternatives.

The effectiveness of Critical Fluid Extraction in groundwater treatment should be considered for treating the concentrated waste streams, such as the spent extract from contaminant extraction processes. This would be the more logical treatment

system to select for incorporation into site alternatives, despite the higher cost.

The activated carbon is included in alternative GW-5, but not for any other alternatives, such as GW-6. Explain this apparent inconsistency.

Estimated flow rates from the treatment system for discharge to Peach Island Creek must be provided. Site specific discharge limits for the creek will be developed by NJDEP when this information is provided. Any discharge to the Creek must meet the limits established by NJDEP; this should be stated in the FS.

Section 3.4

Volatilization During Excavation:

It is clear that limiting the rate of excavation, without any further controls on volatile emissions, is not practical for remediation of soils at the site. Consequently, the references to air modelling in this portion of the text, as well as Appendix I, must be deleted. Controls on volatile emissions will be implemented prior to or during excavation, therefore such modelling of excavation rates, assuming no controls are implemented, is inappropriate. The discussion of volatilization during excavation must be revised as follows:

On pages 3-32 and 3-33, delete the second, third, fourth, fifth and sixth paragraphs under this subheading. Also delete the last sentence in the first paragraph.

Add a new second paragraph, which provides a detailed description of the types of control or containment systems which are potentially useful.

General

The discussion of the effectiveness of a vacuum extraction system is inconsistent. For some alternatives, it is stated that the vacuum extraction system "should considerably reduce the levels of VOCs in soils" (e.g., Alternative S/S-5). However, for other alternatives the unknown efficiency of this technology is pointed out (e.g. Alternative S/S-9). In general, it appears that for alternatives involving merely capping the site, vacuum extraction is assumed to be effective, but for alternatives involving excavation, there are uncertainties with the technology. Correct the inconsistencies. If, for the excavation alternatives, additional controls are deemed necessary, they will be implemented during construction. All alternatives involving vacuum extraction should state that "it expected that the technology will reduce the levels of volatile organics".

The alternatives include different types of slurry walls; some include a "slurry wall", others include a "geomembrane slurry wall", while others include a "concrete wall". The reasoning behind the variations should be provided with each alternative.

The effectiveness evaluations for alternatives involving flushing/contaminant extraction (S/S-8, S/S-9, S/S-10, S/S-11, S/S-15 and S/S-16) should contain a detailed discussion of residual contaminant levels, rather than merely percent removals. Based on the expected residual contaminant levels, (especially for metals and PCBs) stabilization may be required. Therefore, Alternative S/S-15 might be eliminated instead of Alternative S/S-16, which includes stabilization.

It appears that the only partial site treatment alternatives considered were for contaminant extraction. Other technologies, especially incineration, should be examined for partial site treatment. It is not evident that this was considered.

Section 3.4.3.1

In the last sentence of this Section on page 3-39, change the phrase "In addition" to "However,".

Section 3.4.4

(Also see discussion under "Soil/Sludge Treatability Testing", above)

Delete the last three sentences of the first paragraph on page 3-40, which read "This cannot be further developed without additional characterization of the rubble....".

On page 3-41, in the first paragraph under Section 3.4.4.1, delete second sentence; replace with the following: "In situ vacuum extraction would minimize the emission of volatile compounds during excavation. Fugitive dust could be controlled by wetting the disturbed soil, or another appropriate method, to protect on-site workers and the nearby community." (Taken from Page 3-73, Section 3.4.16.1)

Also on page 3-41, in the second paragraph under Section 3.4.4.1, delete the phrase "in an attempt" from the last sentence. Emission controls will have to comply with all Federal and State regulations for air emissions and protection of the nearby community.

Also on page 3-41, delete the last two sentences form the fourth paragraph. There is no basis to raise this concern here; it is not mentioned in relation to other stabilization alternatives

(e.g. S/S-12). In addition, on the previous page it was stated that the incinerator ash from the treatability tests passed the EP Toxicity test, and might not require stabilization.

Delete all references (pages 3-43, 3-45, and throughout the report) to the Hazardous Waste Siting Criteria (NJAC 7:26-13ff), as these criteria only apply to major new commercial Hazardous Waste Facilities. These regulations do not apply to temporary hazardous waste incinerators for Superfund site remedial actions.

On page 3-43 through 3-44, delete all the text beginning with "The efficiency of air pollution control equipment for limiting ....." through the last sentence on page 3-44.

As discussed above, the sole reason for elimination of incineration as a feasible alternative was the analysis of the Cr emissions. For reasons detailed above, this analysis was flawed. Delete all remaining discussions on page 3-45 regarding emissions concerns/remediation times.

The concerns about emissions are adequately discussed under "key issues" to be resolved, on page 3-43.

On page 3-45, delete reference to rubble as a concern; this would apply to all treatment alternatives.

On page 3-46, delete first paragraph, referencing concerns relating volatile and fugitive dust emissions; state that this concern would be addressed through appropriate controls.

Incineration should not be screened out in this phase of the FS. As discussed above, incineration, coupled with metals pretreatment, should be quite effective for, at a minimum, partial site treatment.

Section 3.4.5

On page 3-46, the volume expansion estimate (10-15 %) seems low. No basis for this estimate is provided, and calculations do not appear in the treatability study report. A much higher volume increase would normally be expected. Provide justification for the estimate.

Section 3.4.7

On page 3-53, delete second paragraph under implementability, which discusses the Land Disposal Restrictions. Replace with appropriate discussion, in accordance with general comment, above, regarding LDRs.

In addition, the discussion of TSCA disposal requirements is incorrect. Replace with appropriate discussions, in accordance with general comment above, regarding TSCA requirements.

Section 3.4.11

No justification is provided for the estimate of soil volume with PCB concentrations exceeding 25 ppm. The estimate appears to be half of the estimated total volume.

Figures detailing the PCB concentration contours with depth, which have been previously requested by US EPA, should be included in the report. These figures should be of use in estimating volumes of soil/sludge which exceed target cleanup levels.

It must be pointed out that TBCs for soil indicate that PCB cleanup levels for soil should be between 1 and 5 ppm. This requirement must be considered for PCB treatment. Estimated volumes exceeding 25 ppm, and exceeding 5 ppm must be provided, and an alternative which treats to both requirements must be evaluated.

On page 3-61, it is stated that a cap would be installed over the treated soil/sludge to prevent the infiltration of precipitation, yet in the following paragraph, the cap is to be installed over the entire site. Correct this discrepancy.

On page 3-62, state that contaminant extraction will not achieve 25 ppm in the sludge pit area; treatability study results showed that attainment of this goal for sludge pit area is highly improbable.

Section 3.4.13

On page 3-68, metals removal, for at least some of the soil/sludge, is "technically logical"; results of treatability studies indicated that extraction of metals is feasible. As previously noted, this alternative, for partial site treatment, should not be eliminated.

Section 3.4.14

On page 3-69, The toxicity and volume of contaminants are not significantly reduced through treatment with this alternative. The only contaminants potentially removed in this alternative are volatile organics, and no other contaminants are removed/treated. The statement must be revised to read: "The mobility of the contaminants is significantly reduced."

Section 3.4.15

See comments under Section 3.4.11, regarding volume estimates and target PCB cleanup levels.

Section 3.4.16

This alternative has a lower cost than alternative S/S-5, yet contains the additional treatment step of contaminant extraction. Recalculate the appropriate costs.

Section 3.5

For all tank alternatives involving on-site placement of the tank contents, the Land Disposal Restrictions apply. Therefore, prior to land disposal of the tank contents, compliance with these restrictions must occur.

Tank alternatives should be combined with some partial site treatment alternatives, as discussed above, especially on-site incineration with prior treatment for metals removal.

Section 3.6

Section 3.6.1 (Ground water):

As noted above, not all alternatives were equally effective in contaminant removal, and therefore there are significant differences in relative reductions of groundwater toxicity and the contaminant volume.

Because the report assumes that all alternatives are equally effective, cost is used as the sole means to differentiate between the alternatives. Critical Fluid extraction, (Alternative GW-7) was shown to be the most highly effective groundwater treatment system, but is not selected due to its high cost. The analysis of the Ground Water alternatives should be revised as follows:

> The rental cost of equipment for implementation of Alternative GW-7 should be evaluated. The costs should be substantially reduced if equipment is rented rather than purchased.
>
> In addition, the increased benefit of the Critical Fluid Extraction system's potential usefulness in treatment of soil extraction fluids must be discussed. At a minimum, Alternative GW-7 should be included in all the sitewide alternatives involving contaminant extraction.

Section 3.6.2 (Soil/sludge):

As discussed above, incineration alternatives, and some partial site treatment alternatives should be carried through for detailed analyses. Partial site treatment alternatives should, at a minimum, address more rigorous treatment of the sludges in both the pit and the tank.

Delete reference to siting criteria in the discussion of S/S-4.

Concerns about rubble cannot be used to justify screening some alternatives (such as S/S-4), while not effecting other alternatives. Delete references to rubble concerns in all alternatives.

Similarly, concerns about excavation cannot be used to eliminate certain alternatives, while not impacting the evaluation of other alternatives. The discussion of excavation should read as follows:

> "All alternatives involving excavation would require controls limiting volatile emissions/fugitive dusts."

Do not reference difficulties associated with excavation to eliminate alternatives, since implementation difficulties may be inherent with all excavation alternatives.

Alternative T-8 should not be eliminated simply because off-site incineration of the soils/sludges was eliminated. On-site extraction for metals and off-site incineration is a viable option for the tank contents.

Figures - Section 3

The schematics should include more specific information regarding sludge handling, supernatant returns, or any other waste streams created in the treatment processes.

Tables -Section 3

Table 3-1: Steam stripping results indicate poor treatment of phenolic compounds, benzoic acid and bis(-ethylhexyl) phthalate. The retention of this alternative as the sole groundwater treatment method is not justified, since the polishing step proposed (UV/peroxidation) was not effective at removal of similar compounds. The PCB data is not reliable for this test, since the detection of PCB-1232 is noted, but PCB-1232 was not detected in the samples for the other treatability studies. In addition, the high detection levels for the effluent sampling (120 ppb and 30 ppb) make it difficult to evaluate the effectiveness of this technology.

Table 3-2: The results of the treatability study for UV/Peroxidation indicate little reduction in contaminant concentrations. The table provides columns for influent and effluent, but does not indicate results after pretreatment of the samples. In the Appendix, it is stated that certain samples were pretreated with 200 mg/l alum followed by filtration to reduce turbidity. However, it is unclear whether or not the laboratory analysis was conducted on the pretreated samples. The table should specify whether the pretreatment results are reported in the influent column.

Table 3-3: Although Critical Fluid Extraction significantly reduced concentrations of most contaminants, several compounds (such as PCBs) are still present in the effluent, and therefore, some polishing step may be required.

Table 3-5: The Activated Carbon Tables are confusing; this table provides the raw water concentrations, and the influent water concentrations, while Table 3-4 provides breakthrough profiles. Effluent quality must be summarized here.

Table 3-8: This table indicates that user surcharges are instituted by BCUA for values of BOD and Suspended Solids above 2270 ppb and 390 ppb, respectively. These values are identical to those listed in Table 3-6 for the water table aquifer parameters. It seems unlikely that BCUA standards for instituting user surcharges are identical to those detected in the water table aquifer at the site.

As stated previously, NJDEP will provide preliminary discharge criteria after an evaluation of the estimated flow rates from the treatment plant is made available. These criteria will replace those currently listed in Table 3-8 for discharge to Peach Island Creek.

Table 3-13:

For each alternative in this Table, the Reductions of Contaminant Toxicity, Mobility and Volume should be discussed in terms of which classes of compounds are affected, i.e., volatile organics, PCBs, other organics, inorganics, etc.

Delete from "Short-Term Protectiveness" column the following phrase "-No existing unacceptable risk; shallow groundwater is not currently used as a potable water supply" (and variations of that phrase) from all GW alternatives.

As noted previously, different GW alternatives have different relative effectiveness; this should be noted in this table.

Delete from "Long Term Protectiveness" column the following phrase "-Satisfies objectives underlying soil TBCs" from S/S-3 and S/S 14. Complete stabilization/vitrification alternatives may, through treatment, satisfy these objectives, but containment alone does not.

Under S/S-4, add in the "Short-Term Protectiveness" column the following phrase "would be minimal since it would occur under slurry" to the first bullet. (Also in Alternatives S/S-5, S/S-6, S/S-7, S/S-9, S/S-13, S/S-15.) This concern is the same as in Alternative S/S-3. Other excavation concerns would be dealt with by vacuum extraction. Also, delete the phrase"-Potential unacceptable risks to on-site workers and community from incinerator emissions". Controls on emissions would be implemented to eliminate any potential risks.

Under S/S-5, delete from the "Reductions in Contaminant Mobility" column the following phrase "-some contaminants removed from groundwater", and from the "Reductions in Contaminant Volume" column, the phrase "-Contaminant reduction in shallow groundwater". (Also in other alternatives S/S-12, S/S-14) This alternative deals with soil/sludge, and is not applicable to reduction of groundwater contamination. Under Volume, it is acceptable to state that the water table aquifer will be eliminated, as done in other S/S alternatives.

Under S/S-6, delete from the "Long-Term Protectiveness" column the following phrase "-Failure of vitrified mass poses a possible unacceptable risk to human health and the environment since this technology is not fully proven." Replace with the following "Long term effectiveness expected to be high, but uncertain since technology is not fully proven."

Under S/S-10, delete from "Reduction in Contaminant Toxicity" column the phrase "... ground water removal and...". The reduction in toxicity issue here is related to soil; soil toxicity is being reduced by flushing. The same comment applies to S/S-11. similarly, under the same heading in S/S-12, S/S- 13, S/S-14, S/S-15 and S/S-16, delete references to dewatering, since the dewatering process is not actually reducing the toxicity of the soil/sludge. Rather, the dewatering is contributing to a reduction in mobility, and should be noted under that column.

Under S/S-11, there is no discussion of attainment of App. G ARARS/TBCs.

Although the risk was not quantified for the tank, there should be a complete discussion of potential short term effectiveness of tank alternatives. Under all "T" alternatives, delete the phrase regarding potential risks from the tank not being evaluated. Exposure to tank contents would pose a risk to human health, and tank failure would pose a risk to human health and the

environment, as would exposure/migration to contaminated soils/sludges at the site. (Also in Section 3 text)

Under T-1, revise as directed for alternative S/S-6.

Under T-2, in the "Long-Term Protectiveness" column, there are two conflicting statements. The second is appropriate, as there is a potential for failure of the stabilized tank and the subsequent release of the contents to the environment.

Under T-3, in the "Short-Term Protectiveness" column, delete the following phrase "Potential unacceptable risk from incinerator emissions" Begin bullet with "On-site workers will be protected..." Appropriate emissions controls would be implemented as part of this alternative. Also, under "Reductions in Contaminant...", delete the word "Some" and replace with "Most". (2 places)

Under T-4, unacceptable risks to the nearby community during extraction/stabilization have not been identified; delete these references. (Also applies to T-5,T-6, T-7) Under "Reductions in Contaminant Toxicity", there would also be a reduction via contaminant extraction, as with S/S alternatives involving extraction.

Table 3-14:

Under GW-7, the statement that this is "not a well proven technology" is inconsistent with the data generated during the treatability studies. The treatability studies demonstrated excellent removal efficiencies. In addition, the equipment needed is available, and its use for this purpose is well documented. Revise to be consistent with other GW alternatives.

Under the S/S alternatives, explain why some involve "future land use restrictions", while others only "potential future land use restrictions." If there is no sound reasoning for the difference, correct these inconsistencies.

Under S/S-4, "Administrative Feasibility", delete sentence which reads "Potential difficulty in siting the unit"; no permit would be required for incineration conducted entirely on-site, therefore there is no basis to anticipate such difficulty.

Under S/S-13, "Technical Feasibility" add the phrase "...and proven" to the first bullet (consistent with other alternatives). Also, this alternative cites" off-site manifested transportation required" ; this is probably true for all alternatives involving any off-site disposal of residuals, spent treatment fluids, sludges, etc., and should not be cited only for this alternative.

Section 4

General Comments

Ground Water Treatment:

As discussed above, Ground Water Alternative GW-6 is not expected to be effective in handling concentrated waste streams from a soil washing process. In this section, it is assumed that for alternatives which include soil washing, the groundwater would be treated in the system designed for treatment of the spent soil washing fluid. However, in the discussions of soil washing in alternatives E, F and G, it appears as though the effectiveness of GW-6 is discussed. The Phase III cost estimates (in Appendix K) for these Alternatives include a different price for water treatment ($5.2 million). The basis for this cost must be provided. Clarify what system will be used for these alternatives, if it will not be GW-6. Critical Fluid extraction should be considered for these alternatives.

In addition, the treatability studies indicated that precipitation (coagulation) prior to treatment did not satisfactorily remove all metals to within preliminary discharge criteria for Peach Island Creek. Therefore, the precipitation step may not provide adequate treatment. Explain how this was taken into account in the selection and costing of GW-6 for the site alternatives. Insufficient detail is provided regarding the precipitation process to fully evaluate effectiveness or cost.

Vacuum Extraction:

A detailed description of precisely how this system will operate must be provided (i.e. number of well points, connection method, air flow rates, off-gas treatment, etc.) Without such details, it is difficult to ascertain how the cost was calculated. Fume incineration is included in the Appendix K cost estimate; if this technology has been selected for cost purposes, it should be discussed in this Section. The details of this system must be described, and must be discussed relative to the criteria for detailed analyses. Provide the basis for the assumption of a six month treatment time. The expected effectiveness should be discussed in terms of remaining VOC contaminants; will the VOC concentrations be reduced so that gas withdrawal from under the cap, after its installation, will not be necessary?

Section 4.1

Add to the list of "statutory considerations" on pages 4-1 and 4-2 the following consideration: "long-term maintenance costs"

Revise the order if nine evaluation criteria presented on page 4-2 to read as follows:

-Overall protection of human health and the environment
-Compliance with ARARs
-Long-term effectiveness and permanence
-Reduction of Toxicity, mobility and volume
-Short-term effectiveness
-Implementability
-Cost
-State acceptance; and
-Community acceptance

Revise the order of discussion of these criteria, as shown above, on pages 4-2 through 4-7, and for the discussion relating to each alternative.

Section 4.2

Section 4.2.2

Under Long-Term Effectiveness change "Adequacy of Controls" to "Adequacy and Reliability of Controls" and add as the last sentence the following: "Considers also the long-term reliability of controls for providing continued protection from residual contamination."

Section 4.2.3

Under Reduction of Toxicity, Mobility or Volume, add the following: "-The treatment processes the remedy will employ, and the materials they will treat", "-The degree of expected reduction in toxicity, mobility or volume measure as a percentage of reduction (or order of magnitude)", "-Whether the alternative would satisfy the statutory preference for treatment as a principal element". Delete the second factor listed here "-The degree to which.....will be addressed". A total of six factors will then be listed here and addressed in the detailed evaluation under this criterion.

Section 4.2.4

Under "Technical Feasibility" delete the text for the factor relating to "Reliability of Technology" and replace with "Focuses on the likelihood that technical problems associated with implementation will lead to schedule delays."

Under "Administrative Feasibility" delete the paragraph beginning with "Since each of the site wide alternatives..... " This is a general description of criterion and the text here should not focus on site specific issues. The site specific issues can be addressed later in the report, in the detailed analyses section.

Under "Availability of Services and Materials", delete the following "Timing of the availability of technologies under consideration" and replace with "Availability of prospective technologies".

Section 4.2.6

Add to this section the following: "This criterion will also evaluate the compliance of each alternative with requirements which USEPA has determined are to be considered (TBCs), such as soil cleanup objectives. When an ARAR is not met, the basis for justifying one of the six waivers allowed under CERCLA will discussed." Then add: "For each alternative, the following will be addressed:

-compliance with chemical specific requirements
-compliance with location specific requirements
-compliance with action specific requirements"

Section 4.3

Section 4.3.1

As stated above, the order of evaluation criteria must be revised for all alternatives.

On page 4-8, delete the first paragraph under "Short-term Effectiveness". Replace with "The No Action alternative will not prevent the continued migration of contaminated groundwater from the water table aquifer to the underlying till aquifer in the short term."

In the second paragraph, delete the following "Access to Peach Island Creek is limited by the light industry in its environs, thus making exposure unlikely. This view is consistent with USEPA's EA Summary Table E-2 (Clement Associates 1989) for the SCP site, which did not evaluate risk from surface water contact for that reason."

On page 4-9, delete the word "hypothetical" from the first paragraph. Add to this paragraph "This alternative would allow the continued migration of contaminants from the water table aquifer to other aquifers and surface water."

Also, in the third paragraph, revise the sentence beginning with "Such a release..." to read " Such a release may allow migration of highly contaminated material to other media such as local ground and surface waters."

On page 4-10, under "Overall Protection of Human Health and the Environment", delete the first sentence. Replace with "This

alternative does not prevent the degradation of groundwater underlying the SCP site or the degradation of hydraulically connected media. Contaminants would continue to migrate to the underlying till aquifer, and potentially to the Bedrock aquifer." In the second paragraph, last sentence, delete the word "Potential", and begin sentence with "Contaminant".

Section 4.3.2 (FOU Alternatives B and C)

On Page 4-13, the calculations underlying the 1 gpd recharge rate must be provided. (also under Section 4.3.3 on page 4-21) Also on this page, the first step in the groundwater treatment process was incorrectly identified as "chemical oxidation"; it should be changed to "chemical precipitation".

As discussed above, it is unclear whether consideration was given to settling/cracking due to the variable nature of the fill material. It is possible that excess water will accumulate in the fill layer, due to infiltration through cracks or holes in the cap or gaps between the cap and the slurry wall. The fact that there is a potential for accumulation of this water should be discussed, as should the impact of such accumulation on the underlying till aquifer, due to the contaminants remaining in the soils. This accumulated water will also require periodic pumping/collection and treatment.

It is unclear whether the design of the slurry wall will effectively prevent cracking/gapping after installation from sloughing to the rubble/debris, and thus whether lateral infiltration can effectively be controlled. In addition, identify how the long term integrity of the slurry wall will be ensured. The effect of contaminant migration from the fill via lateral infiltration into the underlying till aquifer must be discussed. It must be stated, in the discussion of long term effectiveness of each alternative, that contaminants have already been demonstrated to migrate through the clay layer into the till aquifer, and therefore, even with the slurry wall in place, there is a possibility of such migration continuing.

As previously discussed, for Alternative C, estimates of concentrations of VOCs are expected to remain in the soils should be provided. If this cannot yet be determined, then on page 4-22, it must be stated that the efficiency of the vacuum extraction system is unknown. Also, under "Reduction of Toxicity, Mobility or Volume", it must be clarified that the vacuum extraction system <u>is expected to</u> remove some of the VOCs; however, high levels of many other contaminants would remain, untreated, in the soils. In addition, state that "There is no reduction of toxicity or volume of the highly contaminated tank sludge."

On page 4-18, under "Compliance with ARARS", delete the sentence which begins "Since containment and groundwater removal...Appendix G soil TBCs." Replace with "Containment and groundwater removal might protect humans from direct contact exposures, and might protect ground water from degradation due to leaching and Peach Island Creek from the migration of contaminated soil/sludge run-off." Leave the following sentence, but delete the words "directly" and "only". The last sentence will then read "It would not, however, meet Appendix G soil/sludge ARARs or TBCs, (i.e., New Jersey Soil Cleanup Objectives)."

On page 4-25, in the first sentence in the first full paragraph, change the word "would" to "might". Also delete the second to last sentence in the first full paragraph, which begins "Therefore...."

Section 4.3.4 (FOU Alternative D)

As stated previously, the estimate for a 10-15% volume increase appears low.

On page 4-28, under "Short-Term Effectiveness" delete the third sentence from the second paragraph. Fugitive dusts will be controlled; therefore there should not be any unacceptable risk to the nearby community.

On page 4-29, under "Long-Term Effectiveness", the fifth paragraph implies that this alternative will mitigate risks to users of the till aquifer. Delete the second sentence and replace with "This alternative would decrease the potential for continued migration of contaminants from the shallow aquifer/contaminated soils/sludges to the till aquifer, but will not immediately eliminate the unacceptable risk to future users of this aquifer."

On pp 4-30 to 4-31, under "Reduction of Toxicity, Mobility or Volume", it must be stated that the vacuum extraction system <u>is expected to</u> remove some of the VOCs; the reductions in toxicity and volume are only related to the VOCs. High levels of many other contaminants would remain in the stabilized mass. In addition, state that "There is no reduction of toxicity or volume of the highly contaminated tank sludge."

On page 4-33, revise the discussion of the LDRs (as noted above) to include how these requirements will be attained. Also, under "Overall Protection of Human Health and the Environment", it is stated that "leachate would not be generated in measurable quantities..." but later in the paragraph, it is stated that "the leachate could include detectable levels of organic compounds..." It should state instead that "Some leachate would be generated due to uncontrollable infiltration into the stabilized mass; this

leachate could include some organic contaminants which were not removed via vacuum extraction." Describe how this leachate would be managed. The statement on page 4-34, that "the leachate is not expected to adversely affect human health and the environment, since the bulk of the mobile organic compounds would be removed by vacuum extraction and leachate quantities would be small" is not substantiated, and must be deleted.

Section 4.3.5 (FOU Alternative E)

On page 4-37, the description of the disposal of the spent extraction fluids must be revised. It is stated that "For purposes of cost evaluation, the treatment system is assumed to consist of the same unit processes as these described for ground water treatment in Site alternative B." The ground water treatment system for that alternative is steam stripping (GW-6).

Based on the treatability studies, it is clear that the spent extraction fluids are likely to contain extremely high levels of PCBs and other organics . In the treatability study report (Volume II Appendix D, pp 27 and 28) it is stated that "used extraction fluids would require significant pretreatment prior to recycling back into an extraction system for reuse due to their high constituent levels...[C]omplete replacement with fresh fluid volumes during soils/sludge processing and off-site disposal of pretreated fluid would be expected." Therefore, it is highly unlikely that the treatment of the extraction fluids utilizing the GW-6 alternative will be possible.

As stated previously, GW-5, Critical Fluid Extraction should be evaluated as a treatment method for these spent fluids; if this technology were utilized, it is likely that the fluids and the groundwater can be handled in the same system. Revise this discussion in light of these comments.

It is not appropriate to state that the final disposal of the extraction fluid may consist of discharge to the Creek or the POTW. On page 4-49, off-site disposal of the spent extraction fluids is contemplated. The disposal/treatment method for these fluids should be more carefully evaluated.

The FS should consider commercially developed systems for which performance data are available (such as the B.E.S.T. system) in the discussion of the extraction alternatives (E, F and G). Previously conducted tests for systems such as this may be more useful in evaluating the effectiveness and implementation of these alternatives.

On page 4-41, under "Compliance with ARARs", (and also on page 4-48 for Alternative F and 4-55 for Alternative G) add the following sentence to the paragraph dealing with PCB cleanup levels :"Therefore,it is uncertain whether this alternative can

achieve the 25 ppm cleanup level which has been established for this site."

On page 4-41, revise the discussion of the LDRs in accordance with the general comment noted above. Include a discussion of how this alternative would meet the requirements of the LDRs.

Also on page 4-41, delete all text in the third paragraph under "Compliance with ARARs", up through the last sentence which reads "It would not, however, directly meet any Appendix G soil/sludge ARARs or TBCs." Replace with : "Containment and groundwater removal might protect humans from direct contact exposures, and might protect ground water from degradation due to leaching and Peach Island Creek from the migration of contaminated soil/sludge run-off."

On page 4-42 (and 4-50 under Alternative F) it is stated that residual PCB levels are expected to be below 108 ppm. This is not supported by the inconclusive treatability study results for PCBs, which indicated residual PCB levels of over 1000 ppm for some sludge samples. Is the 108 ppm an average? Please explain. If it is an average of soil and sludge, provide an estimate of the expected residual level of PCBs in soil alone, if the sludge is treated separately (i.e. by incineration).

Section 4.3.6 (FOU Alternative F)

Under "Short Term Effectiveness" , the effectiveness relative to the groundwater component of this alternative should be discussed (it should be the same as Alternative B, as discussed in other alternatives).

On page 4-45, clarify what is meant by the first statement under "long -term Effectiveness" that "the integrity of the concrete slurry wall is not expected to change significantly over time". Define what is considered "significantly". This should be revised to be consistent with the statement made for the other alternatives.

On page 4-46, under "Reduction of Toxicity, Mobility or Volume", add the following sentence to the last paragraph: "However, this alternative would not reduce the toxicity or mobility of other contaminants not affected by the extraction processes." (as was stated in Section 4.3.5). Also, in the first sentence in the same paragraph, revise to read "Vacuum extraction and on-site soil washing would permanently remove <u>some</u> contaminants from the soil/sludge."

Section 4.3.7 (FOU Alternative G)

On page 4-55, revise the discussion of the LDRs in accordance with the general comment noted above. Include a discussion of how this alternative will meet the requirements of the LDRs.

On page 4-53, under "Reduction of Toxicity, Mobility or Volume", add the following sentence to the last paragraph: "However, this alternative would not reduce the toxicity or mobility of other contaminants not affected by the extraction processes." (as was stated in Section 4.3.5). Also, in the first sentence in the same paragraph, revise to read "Vacuum extraction and on-site soil washing would permanently remove some contaminants from the soil/sludge."

Section 4.3.8 (FOU Alternative H)

The upgraded slurry wall design may not be necessary for this alternative, since its primary function is to isolate the water table aquifer for dewatering. The Appendix K cost estimate shows a bentonite wall.

As discussed previously, consideration should be given to treating hot spots by ISV, especially for the site sludges. Such an alternative can be developed in parallel with FOU Alternative H, which would be a variation of H with the remaining areas treated by some other means. This would significantly reduce the treatment time and cost for this alternative.

Explain how the addition of one or more treatment units would effect the treatment time/costs. Provide the backup for calculations regarding treatment volumes/times.

On page 4-58, it is stated that there is "a limit of total metal in the melt of 5-10 percent by weight to avoid short circuiting of the system." Explain how the extremely high metal content in certain site soils, and in the sludges, are expected to effect the process.

On page 4-64, it is stated that the power requirements are "900Kwh/ton or 3.1 megawatts/melt". The statement on Page 4-59 which quantifies a single melt as approximately 482 tons. There appears to be a discrepancy in the calculations. Check how this affects the cost estimates provided, since the power requirements have a significant impact on the costs of this alternative. Provide the correct power estimate/cost calculation.

Section 4.4

On page 4-67, change "Table 4-2" to "Table 4-3".

Section 5

The revised FS should not recommend a remedial alternative; this Section must be deleted, and other references to the recommended alternative elsewhere in the FS should be deleted.

Appendix K

Cost Estimates:

As stated previously, the cost of rental equipment for short-term ground water remediation should be evaluated.

The cost for the multimedia cap in S/S-3 and S/S-14 does not include cost for the clay and low-permeability soil layers. The estimate of $4.70/sq. ft. may be low; the cost would probably be $5.50 to $6.00/sq. ft.

All the alternatives involving contaminant extraction should include costs for segregating and washing larger pieces of rubble, as described in Section 4.0. Also, the $100/cu.yd. is probably a low estimate considering the amount of materials handling which will be required.

Correct the discrepancy between the Phase II and Phase III O & M cost estimated for GW-6 in annual electric power, monitoring, and O & M labor costs. Also, 22 tons of sludge used in costing, while the text (page 4-14) reports 44 tons of sludge for disposal. Correct this inconsistency. The cost of the disposal of 10,000 gallons of organic decant is not included.

The cost for the dewatering system is missing for alternatives S/S-5, S/S-9, S/S-14, S/S-15, and S/S-16 (Site Alternatives D,G, C, E and F). Revise accordingly.

As stated in the general comment regarding costs, above, the contingency/indirect cost figures must be revised, and more detailed information regarding cost breakdowns/assumptions must be included in the revised FS.